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Original quantitative research

What popular bars post on social media platforms: a case for improved alcohol advertising regulation

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Abstract

Introduction: The aim of this study was to document the scope of violations of the Canadian Radio-television and Telecommunications Commission (CRTC) "Code for Broadcast Advertising of Alcoholic Beverages" (CRTC Code) by drinking venues posting alcohol-related content on social media platforms, and to assess whether CRTC Code violations by drinking venues relate to their popularity among university students and to students' drinking behaviours.

Methods: In phase 1 of the study, a probability sample of 477 students from four Canadian universities responded to a questionnaire about their drinking and preferred drinking venues. In phase 2, a probability sample of 78 students assessed the compliance of drinking venues' social media posts with the 17 CRTC Code guidelines. We pooled both datasets and linked them by drinking venues.

Results: Popular drinking venues were overwhelmingly posting alcohol-related content that contravenes the CRTC Code. Adjusted effect estimates show that a decrease in the mean level of compliance with the CRTC Code was significantly associated with a 1% increase in popularity score of drinking venues (t-test, $p < .001$). With regard to drinking behaviours, a 1% increase in the overall mean level of compliance with the CRTC Code was associated with 0.458 fewer drinking days per week during a semester (t-test, $p = .01$), 0.294 fewer drinks per occasion (t-test, $p = .048$) and a lesser likelihood of consuming alcohol when attending a drinking venue (t-test, $p = .001$).

Conclusion: The results of this study serve as a reminder to territorial and provincial regulatory agencies to review their practices to ensure that alcohol advertising guidelines are applied and enforced consistently. More importantly, these results call for the adoption of federal legislation with a public health mandate that would apply to all media, including print, television and radio, digital and social.

Keywords: *advertising, alcoholic beverages, social media, students, universities*

Highlights

- According to Canadian university students surveyed, popular drinking venues are overwhelmingly posting alcohol-related content on Facebook and Instagram that contravenes the CRTC "Code for Broadcast Advertising of Alcoholic Beverages" (CRTC Code).
- The heaviest drinkers tend to prefer drinking venues that post images that violate several CRTC Code guidelines.
- The current self-regulatory system fails Canadian youth by not taking action when a great number of alcohol portrayals and promotions support a culture of excessive drinking.
- The federal government should adopt new legislation that would apply to all media, include mandatory preclearance of alcohol advertisements and administrative and deterrence systems for infringements on marketing restrictions.

Introduction

To reduce the harmful use of alcohol, particularly by young people, the World Health Organization (WHO) recommends limiting the impact of alcohol marketing by setting up regulatory frameworks.[1] This recommendation is supported by accumulating evidence that alcohol advertisements increase the likelihood of young people starting to drink and the amount they drink both overall and on any one occasion.[2-6]

In Canada, alcohol marketing and advertising is regulated at both the federal and provincial levels. At the federal level, all radio and television advertising must comply with the Canadian Radio-television and Telecommunications Commission's (CRTC) "Code for Broadcast Advertising of Alcoholic Beverages" (the "CRTC Code")[7] and advertisers must obtain pre-clearance for all broadcast ads from broadcasters.[8] In addition, provinces and territories have implemented restrictions on alcohol advertising similar to those outlined in the CRTC Code, and provincially-licensed alcohol retailers are similarly restricted in how they can promote alcohol in their establishments. With digital media overtaking other traditional media channels such as television, radio and the press,[9,10] several provinces, including British Columbia, Ontario, Quebec and Nova

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Scotia, have adopted restrictions on alcohol advertising and marketing that apply to both broadcast and nonbroadcast ads, including web advertising.

Although the CRTC developed the Code, it issued a public notice in 1996 saying it was "no longer necessary to involve itself in the pre-clearance process" and that, instead, it was encouraging self-regulation by the industry and broadcasters, and relying on provincial regulations.[11] Since then, very few CRTC Code violations have been recorded.[8] However, this may simply correspond to what experts have been claiming for years: that allowing industry self-regulation results in a loss of policy control over alcohol marketing and advertising.[12] Indeed, since 1997, consumers, groups or agencies who have a concern about the content of a specific alcoholic beverage advertisement must submit a complaint through the Ad Standards (Advertising Standards Canada [ASC]) website for the Standards Council to evaluate whether the advertisement violates the CRTC Code or not.[13] If the complaint focusses on spirits, before directing it to the Council, Ad Standards' staff must take an additional step, making a preliminary determination whether there has been an infraction of one or more provisions of the Spirits Canada "Code of Responsible Advertising and Marketing." In this context, that there has only been a small number of reported violations may not be evidence of an advertising landscape promoting safe and responsible alcohol use. Instead, it might only reflect a self-regulatory system in which a CRTC Code violation can only be recorded if a complaint is submitted by the public and then receives an adverse evaluation from an industry-backed council.

An additional concern is that the apparent loss of control over alcohol marketing and advertising may be even more pronounced online. Social media has become a key platform for alcohol brands, one that makes it possible for advertisers to spread messages via consumers and involve them in the production of marketing content.[14] While it offers new possibilities for interaction between alcoholic beverage companies and their potential consumers, it also allows drinking venues to distribute alcohol-related marketing messages on a mass scale. A recent UK study found that drinking venues regularly post on social media platforms, and that it is not uncommon for venues to present images associating alcohol with social success, sexual attractiveness and intoxication.[15]

Given that virtually all Canadians aged 15 to 24 use social networking sites[16] and that almost all youth are likely to be exposed to alcohol-related content on social media platforms,[17] Canadian youth may routinely be exposed to alcohol marketing and advertising that violates the CRTC Code. From a public health perspective, this is concerning because exposure to alcohol marketing is associated with measures of early life drinking, youth alcohol use, binge drinking and other negative consequences.[18-20] Moreover, the highest proportion of heavy drinking for both sexes in Canada is among those aged 18 to 34 years. In this age group, 33.5% of males and 23.8% of females are heavy drinkers.[21] Among young people who attend postsecondary institutions, preliminary results based on the 2018 pilot phase of the Canadian Postsecondary Education Alcohol and Drug Use National Survey (CPADS) showed that 64% of male drinkers reported having five or more drinks and 61% of female drinkers reported having four or more drinks on one occasion in the past 30 days.*

The aim of this study was to get a better sense of the extent to which Canadian youth might be exposed to alcohol marketing and advertising that "promote[s] the general consumption of alcoholic beverages"[11] or that "contribute[s] to the negative health and societal effects relating to excessive or inappropriate alcohol consumption."[11] Our study focussed on university students, a key audience for alcohol advertising on social media platforms. It aimed to measure the scope of CRTC Code violations on social media platforms by drinking venues and to assess whether there is an association between these venues' CRTC Code violations and their popularity, as well as the students' drinking behaviours.

Methods

Survey design, sampling and data collection

Following ethical approvals for the project,† we used a cross-sectional survey design to collect data during the winter and fall semesters of 2017 from convenience samples of students from four different Canadian universities (University of Victoria, Queen's University, Bishop's University and Dalhousie University), in two separate phases described below. A diagram of the study is presented in Figure 1.

Phase 1

Using recruitment flyers posted both online and around campus, as well as the presence of a research coordinator at a booth space in a high-traffic area on university property, we gathered convenience samples of students who were fluent in English, who were at least 19 years of age and who had frequented a drinking venue at least once a month over the course of the previous semester, for a total of 477 students. These students were invited to fill out an online questionnaire that included questions about (1) the frequency of their drinking ("Over this semester, how many days per week have you usually drunk alcohol?"); (2) the average quantity they consumed on a single occasion ("On a day when you drank alcohol, how many standard drinks did you usually have?"); and (3) the frequency of their drinking when attending drinking venues ("How often when you go out to a bar/pub/club do you drink alcohol?"). The possible responses were (1) never, (2) sometimes, (3) half of the times, (4) most of the times and (5) all the times. Students were also asked about their favourite and second favourite drinking venues ("Which bar/pub/club do you frequent most/second most often, i.e. your favourite/second favourite bar?"). Participating students were offered $10 gift cards as compensation for their time, and at the University of Victoria, students recruited through the Psychology Research Participation System were awarded 0.5 course credits.

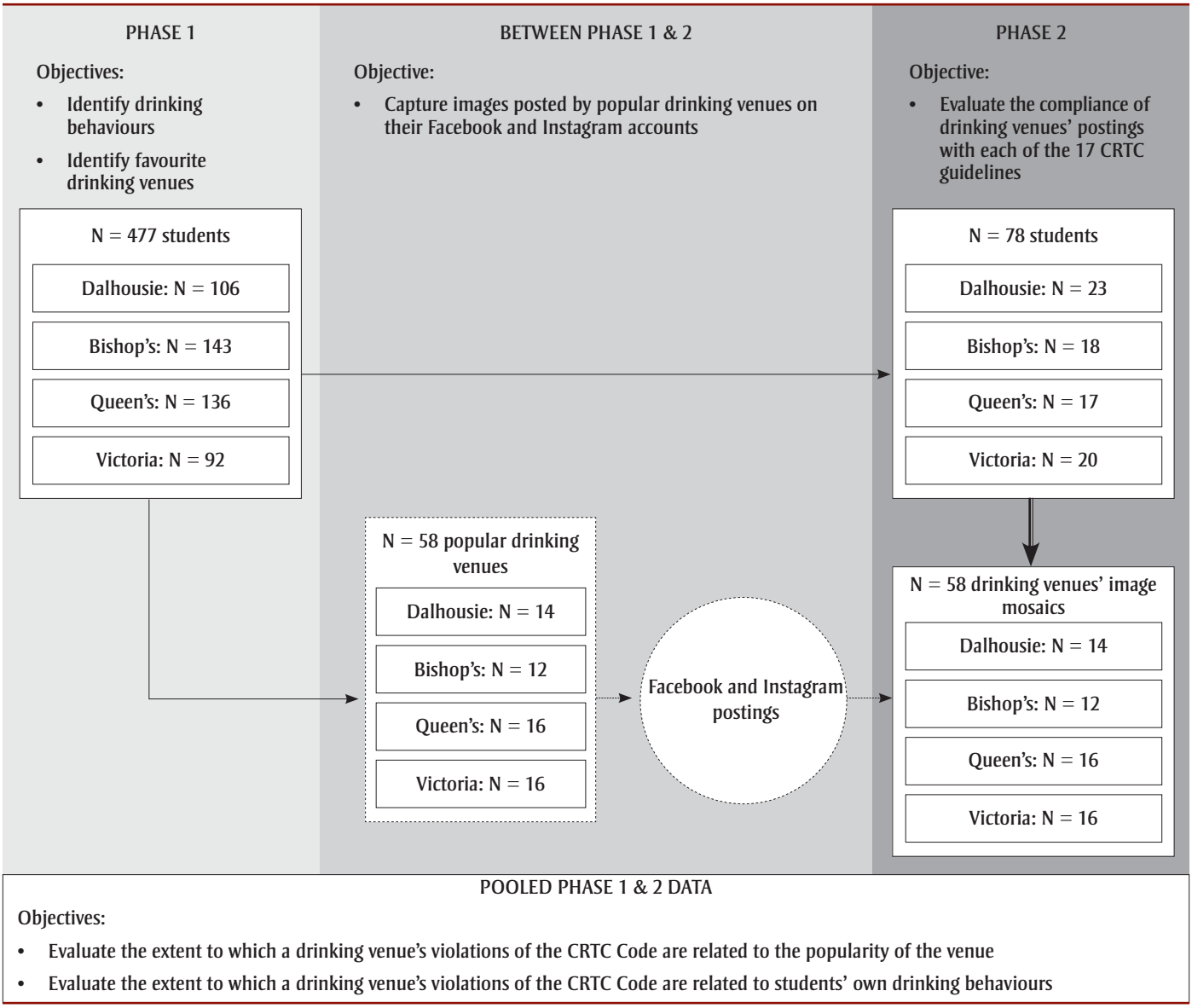
Moving from phase 1 to phase 2

Based on data collected in phase 1, we identified the most popular local drinking venues on each campus by assigning 2 points to a venue each time it was named as a favourite drinking venue and 1 point when it was named as a second favourite. The initial goal was to identify the 16 most popular drinking venues on each campus, but at Dalhousie University

* Data available from the corresponding author.

† Dalhousie University Research Ethics Board (2017-4273); Bishop's University Research Ethics Board (101576); Queen's University Health Sciences Research Ethics Board (6021533); University of Victoria Human Research Ethics Board (16-384).

FIGURE 1
Design of study on the relationships of social media alcohol advertising by drinking venues, the popularity of those venues, and university students' drinking behaviours, Canada, 2017



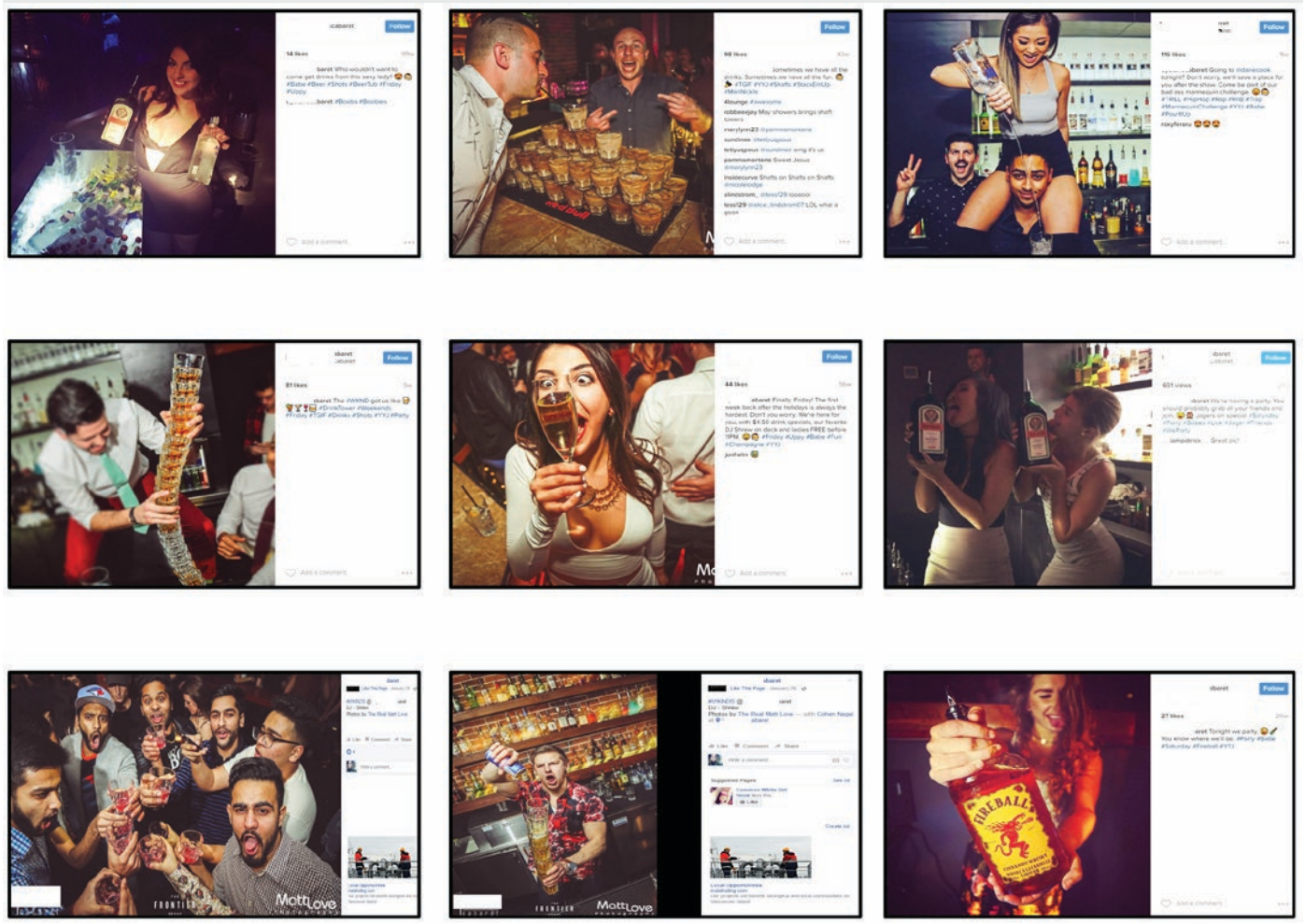
and Bishop's University, students' responses only allowed for the identification of 14 and 12 venues, respectively, for a grand total of 58 popular local drinking venues across the four campuses.

Next, two members of our research team visited the Facebook and Instagram accounts—the two most popular social media platforms among Canadian youth aged 18 to 34[22]—of the 58 popular drinking venues. They selected up to 20 postings that captured a variety of images for each of the campuses' local drinking venues; preference was given to images that provided the opportunity to analyze compliance with six key themes of the CRTC Code as determined by the ASC.[13,‡] These images were further evaluated by two other research team members for compliance with the 17 CRTC Code guidelines.[7,§] An example of a question asked by investigators to evaluate image compliance is: "Do any of these images attempt to influence nondrinkers of any age to drink or to purchase alcoholic beverages?" We used a five-point Likert scale to collect the responses (1 = definitely, 2 = probably, 3 = unsure, 4 = probably not, 5 = definitely not), where a higher score indicated greater compliance with the CRTC Code. For each venue, we selected the nine images that received the lowest score, and consequently appeared most to conflict with the CRTC Code, and arranged them into three-by-three mosaics (Figure 2).

‡ The ASC has grouped the clauses of the CRTC Code under six key themes: (1) "Advertising must not encourage the general consumption of alcohol"; (2) "Advertising must not promote the irresponsible or illegal use of alcohol"; (3) "Advertising must not associate alcohol with social or personal achievement"; (4) "Advertising must not be directed to persons under the legal drinking age"; (5) "Advertising must not associate alcohol with the use of motor vehicles or with activities requiring a significant degree of skill or care"; and (6) "Contest and promotion requirements."[13,p.4]

§ Individual guidelines may be viewed at https://crtc.gc.ca/eng/television/publicit/codesalco.htm

FIGURE 2
Picture mosaic created from alcohol-related images posted to social media by drinking venues, ranked by investigators as conflicting most with the CRTC Code guidelines



This allowed us to create, for each university, a unique booklet containing between 12 and 16 picture mosaics, one for each popular local drinking venue.

Phase 2

From the students who in phase 1 had indicated interest in being contacted again, we recruited a group of 78 students (20 at the University of Victoria, 17 at Queen's University, 18 at Bishop's University and 23 at Dalhousie University) via email to rate popular drinking venues' postings against the CRTC Code guidelines. The participating students were invited to a room where they were provided with their campus booklet. By using the same rating procedure described earlier, students were instructed to evaluate each drinking venue's picture mosaic for compliance with the CRTC Code. The exercise was repeated between 12 and 16 times, depending on how many popular local drinking venues had been identified at a particular campus. It took between one and two hours for students to complete the evaluation. A $30 gift card was offered to participants to thank them for their time.

Analyses

First, we performed descriptive analyses. Based on phase 1 data, we used ANOVA and chi-square tests to examine the sample characteristics and identify potential confounding effects of sociodemographic variables that should be adjusted for in multivariate regression analyses. Once the CRTC Code rating executed by students in phase 2 was completed, we confirmed modest interrater reliability by a Spearmen correlation analysis (0.52), a Fleiss' kappa coefficient of 0.21[23] and a mean percent agreement of 61% (0 = rated definitely noncompliant, probably noncompliant or unsure; 1 = rated probably compliant or definitely compliant). Then, based on students' mean rating scores of each drinking venue's mosaic obtained in phase 2, we calculated a measure of compliance with each of the 17 CRTC Code guidelines across all drinking venues.

Second, we connected both phase 1 and phase 2 databases by linking data on the drinking venues, which were uniquely identified in each phase: phase 1 data included students' favourite drinking venues and their drinking behaviours, and phase 2 data included students' mean rating scores of each drinking venue's mosaic for each CRTC Code guideline. From these pooled data, we performed two series of multivariate regressions[24] and adjusted both for potential confounding effects of

age, education, year of study, study subject and campus site.

For the first series, we examined the association between the extent to which drinking venues' Facebook and Instagram postings violate the CRTC Code (in their original metrics) and drinking venues' popularity (natural log-transformed) so as to estimate changes in mean compliance scores associated with a 1% change in popularity. For the second series, we examined the association between students' drinking behaviours (i.e. frequency of drinking, average quantity consumed in a single occasion and frequency of drinking when attending drinking venues) in their original metrics, and the extent to which the drinking venues they tend to prefer posted images on social media platforms that violate the CRTC Code (natural log-transformed).

For both analyses, we used the natural logarithm of the independent variables. We performed the log transformations to account for the non-normal distribution of the variables and reduce the effects of extreme values, and because they were only performed on the independent variables, they did not significantly affect the nature of the relationships under study. All statistical analyses were conducted using SAS Version 9.3 (SAS Institute Inc., Cary, NC, USA, 2011).

All significance tests assumed 2–tailed p-values ($p < .05$). The adjusted effect estimates and corresponding 95% confidence intervals (CIs) are reported.

Results

Phase 1

The descriptive results presented in Table 1 indicate that the mean age of sample participants was 20.8 years and that the vast majority were undergraduates (90.8%). These characteristics varied significantly between the four universities, with Bishop's

TABLE 1
Characteristics of phase 1 sample of students from four Canadian universities

Characteristics	Queen's University		Dalhousie University		Bishop's University		University of Victoria		Total	
	N	M/%[a]	N	M/%[a]	N	M/%[a]	N	M/%[a]	N	M/%[a]
Age										
Mean	136	20.40	106	21.81	143	19.75	92	21.74	477	20.78
SD		2.15		5.14		2.44		3.03		3.38
Min		17.00		18.00		17.00		19.00		17.00
Max		35.00		54.00		33.00		34.00		54.00
T-test p		.002		.877		<.001		ref		<.001[b]
Education level										
Undergraduate	127	93.38	88	83.02	137	95.80	81	88.04	433	90.78
Graduate	9	6.62	18	16.98	6	4.20	11	11.96	44	9.22
χ^2 p		.168		.321		.032		ref		.006[b]
Alcohol drinking days per week										
Mean	136	1.80	106	1.83	143	2.14	92	1.86	477	1.92
SD		1.34		1.45		1.59		1.54		1.48
Min		0		0		0		0		0
Max		7		7		7		7		7
T-test p		.771		.900		.1589		ref		.212[b]
Usual number of alcoholic drinks per occasion										
Mean	136	3.34	106	2.61	143	3.07	92	3.90	477	3.21
SD		3.52		3.53		3.02		2.88		3.28
Min		0		0		0		0		0
Max		30		26		13		15		30
T-test p		.205		.006		.057		ref		.044[b]
Alcohol drinking frequency when attending a drinking venue										
Mean	136	3.31	106	3.41	143	3.30	92	3.80	477	3.42
SD		1.39		1.34		1.31		1.32		1.35
Min		1		1		1		1		1
Max		5		5		5		5		5
T-test p		.006		.037		.005		ref		.022[b]

Abbreviations: Max, maximum; Min, minimum; ref, reference group; SD, standard deviation.

[a] M = mean of age, drinking days weekly, usual number of drinks per occasion and drinking frequency at drinking venues; % of undergraduates and graduates.

[b] Across all sites T-test or χ^2 test p.

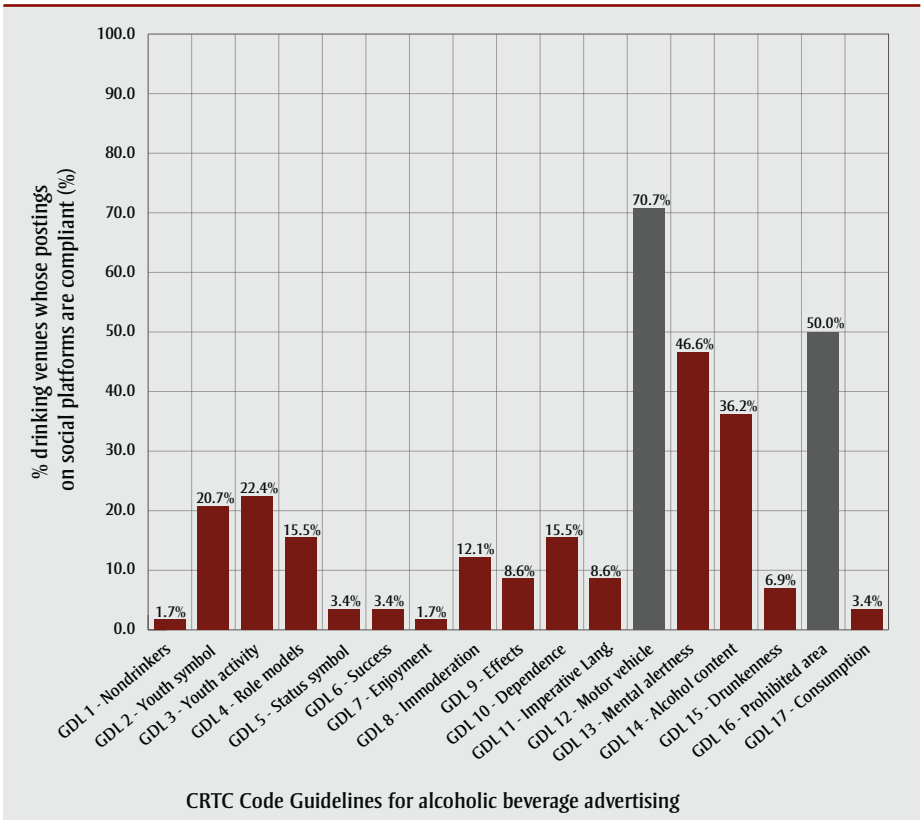
students being younger (t-test, $p < .01$) and more likely to be undergraduates (chi-square, $p > .01$). On average, students reported drinking alcohol 1.92 days per week. The average number of alcoholic drinks per occasion was 3.20 and varied significantly across sites (t-test, $p = .044$) with students from the University of Victoria reporting a greater number of alcoholic drinks per occasion than students from Dalhousie University. Regarding the frequency of drinking alcohol when going out to a bar, a pub or a club, students' average response was 3.42 (meaning more than "half of the times") and varied significantly across campuses (t-test, $p = .022$) with students from the University of Victoria reporting drinking more often than their counterparts at the other campuses.

Phase 2

Drinking venues' compliance with the CRTC Code, according to students

Figure 3 presents, for each CRTC Code guideline, the percentage of drinking venues rated by phase 2 students as being probably or definitely compliant, i.e. to whom students gave an average score of 4.0 or higher. For example, for guideline 12, according to which commercial messages for alcoholic beverages shall not "introduce the product in such a way or at such a time that it may be associated with the operation of any vehicle or conveyance requiring skill,"[7] students' evaluations indicated that 71% (42/58) of drinking venues posted images on social media platforms that probably or definitely complied with this particular CRTC Code guideline. In the same vein, students' evaluations showed that 50% of venues (29/58) posted images that probably or definitely adhered to guideline 16, according to which postings shall not "portray persons with any such product in situations in which the consumption of alcohol is prohibited."[7] However, for the remaining 15 guidelines, students evaluated that no more than 46.6% (27/58) and as little as 1.7% (1/58) of drinking venues posted images on social media platforms that adhere to the CRTC Code.

FIGURE 3
Percentage of drinking venues with postings on social media platforms rated by students as being compliant with CRTC Code[a] guidelines



Abbreviations: CRTC, Canadian Radio-television and Telecommunications Commission; GDL, guideline; Lang., language.
[a] CRTC Code for Broadcast Advertising of Alcoholic Beverages.[7]

Pooled phase 1 and phase 2

Tables 2 and 3 present results based on pooling data from phase 1, in which students indicated their drinking behaviours and their favourite drinking venues, with data from phase 2, in which a subgroup of students evaluated the compliance of drinking venues' postings with each of the 17 CRTC guidelines.

Drinking venues' compliance with the CRTC Code and popularity among students

In Table 2, adjusted effect estimates show that a lower mean level of compliance with the CRTC Code was significantly associated with a 1% higher popularity score of drinking venues (adjusted estimate: −.158, 95% CI: −.219 to −.097; t-test, $p < .001$). More specifically, a lower mean level of compliance with the CRTC Code guideline 1 (t-test, $p < .001$), guideline 2 (t-test, $p < .001$), guideline 3 (t-test, $p = .002$), guideline 5 (t-test, $p = .036$), guideline 6 (t-test, $p = .003$), guideline 7 (t-test, $p = .004$), guideline 15 (t-test, $p = .017$) and guideline 17 (t-test, $p = .002$) was significantly associated with a drinking venue's popularity. Put differently, there was a significant association between students' preferences for certain drinking venues and these venues' propensity to post images on social media platforms that violate the CRTC Code in general and eight specific guidelines in particular.

Drinking venues' compliance with the CRTC Code, and student drinking behaviours

Table 3 presents the association between CRTC Code compliance by drinking venues and students' drinking behaviours during the semester. Adjusted effect estimates indicate that a 1% higher overall mean level of compliance with the CRTC Code was significantly associated with 0.458 fewer drinking days per week during a semester (95% CI: −0.806 to −0.111; t-test, $p = .01$), 0.294 fewer drinks per occasion (95% CI: −0.584 to −0.003; t-test, $p = .048$) and a lesser likelihood of consuming alcohol when attending a drinking venue (adjusted estimate: −0.302; 95% CI: −0.471 to −0.133; t-test, $p < .001$). Overall, these results indicate that the lightest drinkers preferred drinking venues whose images posted on social media platforms complied with the CRTC Code, or contrariwise, that the heaviest drinkers tended to prefer drinking venues whose images posted on

TABLE 2
Changes in mean levels of compliance with the CRTC Code[a] guidelines according to 1% higher score in drinking venues' popularity

CRTC	N	Mean	Unadjusted effect estimate[b]			Adjusted effect estimate[b,c]		
			Estimate	95% CI	T-test *p*	Estimate	95% CI	T-test *p*
Mean CRTC Code score	986	3.156	−0.093	−0.143 to −0.043	< .001	−0.158	−0.219 to −0.097	< **.001**
GDL 1 - Nondrinkers	58	2.935	−0.171	−0.281 to −0.061	.003	−0.263	−0.380 to −0.147	< **.001**
GDL 2 - Youth symbol	58	3.390	−0.166	−0.309 to −0.023	.024	−0.283	−0.429 to −0.138	< **.001**
GDL 3 - Youth activity	58	3.478	−0.116	−0.258 to 0.026	.108	−0.230	−0.373 to −0.087	**.002**
GDL 4 - Role models	58	3.428	−0.033	−0.157 to 0.092	.602	−0.070	−0.208 to 0.069	.317
GDL 5 - Status symbol	58	2.693	−0.146	−0.304 to 0.012	.069	−0.179	−0.347 to −0.012	**.036**
GDL 6 - Success	58	2.804	−0.203	−0.333 to −0.073	.003	−0.213	−0.349 to −0.076	**.003**
GDL 7 - Enjoyment	58	2.434	−0.191	−0.327 to −0.055	.007	−0.210	−0.352 to −0.069	**.004**
GDL 8 - Immoderation	58	2.720	−0.145	−0.356 to 0.067	.176	−0.184	−0.428 to 0.061	.138
GDL 9 - Effects	58	3.135	+0.038	−0.119 to 0.194	.632	+0.048	−0.117 to 0.214	.559
GDL 10 - Dependence	58	3.185	−0.080	−0.259 to 0.098	.370	−0.087	−0.289 to 0.115	.391
GDL 11 - Imperative language	58	3.009	−0.077	−0.244 to 0.091	.363	−0.015	−0.210 to 0.180	.875
GDL 12 - Motor vehicle	58	4.223	+0.077	−0.054 to 0.209	.243	+0.004	−0.122 to 0.130	.948
GDL 13 - Mental alertness	58	3.987	+0.025	−0.108 to 0.158	.706	−0.045	−0.189 to 0.100	.537
GDL 14 - Alcohol content	58	3.563	−0.007	−0.175 to 0.162	.936	−0.115	−0.292 to 0.063	.202
GDL 15 - Drunkenness	58	2.651	−0.251	−0.438 to −0.064	.01	−0.259	−0.471 to 0.048	**.017**
GDL 16 - Prohibited area	58	4.009	+0.029	−0.090 to 0.148	.625	−0.080	−0.181 to 0.021	.119
GDL 17 - Consumption	58	2.002	−0.170	−0.354 to 0.013	.068	−0.264	−0.425 to −0.103	**.002**

Abbreviations: CI, confidence interval; CRTC, Canadian Radio-television and Telecommunications Commission; GDL, guideline.
Note: Bolded type indicates statistically significant effect.
[a] CRTC Code for Broadcast Advertising of Alcoholic Beverages.[7]
[b] The effect estimates were interpreted as change in mean CRTC scores due to a 1% increase in popularity scores, since the independent measure was natural log–transformed.
[c] Adjusted for age, education, year of study, study subject and site.

social media platforms were less compliant with the CRTC Code.

Discussion

Twelve years ago, it was suggested that to enhance public health and safety, Canadian policy should aim to support and improve the current self-regulatory system and eventually ban both broadcast and nonbroadcast alcohol ads.[25] Although there have been doubts as to whether a total ban on alcohol marketing on social platforms would succeed,[26] at least two countries have taken steps in that direction. In 2015, the Finnish parliament adopted a law that restricts any alcohol-related web content that is intended to be shared by consumers. In Sweden, a new law will forbid commercial advertising on social media to be used to market alcohol products.[14] According to Lindeman and Hellman,[27] these initiatives are bringing to light that proper enforcement requires persistent monitoring and regional collaboration for enforcing policies on social media advertising, something that Canada might want to explore.

Strengths and limitations

This innovative study contributes to research on web alcohol advertising first by documenting the scope of CRTC Code violations by drinking venues posting alcohol-related content on social media platforms. A central result of this study is that, from the point of view of the average Canadian university student, popular drinking venues are overwhelmingly posting alcohol-related content that contravenes the CRTC Code and supports a culture of excessive drinking. In Nova Scotia, Quebec, Ontario and British Columbia, i.e. four provinces where regulatory agencies have restrictions on web alcohol advertising, drinking venues tend to post images that associate alcohol with immoderate consumption, the enjoyment of activities and events, social status, personal success and achievements. Contrary

TABLE 3
Change in university students' drinking behaviours in a semester according to 1% higher scores in drinking venues' compliance with CRTC Code

		Alcohol drinking days per week	Usual number of alcoholic drinks per occasion	Alcohol drinking frequency when attending a drinking venue
	N	986	986	986
	Estimate	−0.355	−0.282	−0.417
Unadjusted effect estimate[a]	95% CI	−0.769 to 0.059	−0.610 to 0.456	−0.614 to −0.220
	T-test *p*	.093	.092	< .001
	Estimate	−0.458	−0.294	−0.302
Adjusted effect estimate[a,b]	95% CI	−0.806 to −0.111	−0.584 to −0.003	−0.471 to −0.133
	T-test *p*	**.01**	**.048**	**.001**

Abbreviations: CI, confidence interval; CRTC, Canadian Radio-television and Telecommunications Commission.

Note: Bolded type indicates statistically significant effect.

[a] The effect estimates (95% CI) were interpreted as one unit change in drinking measures due to a 1% increase in compliance scores with CRTC Code guidelines.

[b] Adjusted for age, education, year of study, study subject and site.

to the intent of the CRTC Code guidelines, students also found it common for drinking venues to post scenes in which alcohol is consumed or images that attempt to influence nondrinkers to drink.

These results are in line with the general findings in the literature showing that self-regulatory marketing codes fail to prevent the dissemination of content that circumvents the spirit of marketing code guidelines, in particular those concerning social or sexual success enhancement and protection of youth.[28,29] Our results, like those of others,[30] suggest that self-regulatory systems that govern alcohol marketing practices are not meeting their intended goal of protecting vulnerable populations. Clearly, the current self-regulated system fails Canadian youth by not taking action when a great number of alcohol portrayals and promotions support a culture of excessive drinking. Furthermore, because of the clear relationship between sexist and demeaning (to women) alcohol advertising and sexual victimization,[31] this unregulated environment may be especially risky for young women.

Second, by pooling results from phase 1 with those from phase 2, we obtained additional results worth emphasizing. There was a significant association between drinking venues' propensity to post images on social media platforms that do not comply with the CRTC Code and students' preferences for these venues. This association may illustrate that by posting noncompliant content, drinking venues manage to attract the attention of students and bring them in. Obviously, in a competitive environment where there are no legal consequences to posting content that contravenes the self-regulatory CRTC Code, drinking venues seeking to attract students will be tempted to post images that normalize and trivialize excessive or inappropriate alcohol consumption.

Finally, our study brought to light the extent to which CRTC Code violations relate to drinking behaviours. University students who drink more tend to prefer venues whose images posted on social media platforms violate several CRTC Code guidelines. This might be a result of natural selection, whereby the heaviest drinkers attend venues that post images indicating they may meet others who drink like them. However, given that increases in student alcohol consumption match decreases in compliance with the CRTC Code, we must acknowledge that posting images that promote excessive drinking may contribute to normalizing the behaviour. Once again, this may have more severe repercussions for young women than for young men, as women who say they sometimes or often consume more alcohol than they should are twice as likely to be victims of completed, attempted or suspected sexual assaults than those who only sporadically or never use alcohol.[32]

Besides the usual challenges associated with cohort studies, which do not allow for establishing causality, this study has a few limitations. First, the process by which we selected the images, that is, ranking their compliance with the CRTC Code and then selecting the least compliant images to put in the mosaics, means that they cannot be considered representative of all alcohol-related posts on Facebook and Instagram. Though this could be considered a limitation, any deviation from the guidelines can be considered cause for concern.

Second, because of its innovative nature, this study lacks standardized measures. Notably, to allow students to evaluate the alcohol-related content posted by drinking venues on social media platforms, we had to develop a survey adapted from the CRTC Code. While we are unaware of previous studies that have adapted the CRTC Code in this manner, we would argue that the instrument has face validity, since each item asking about compliance used precise wording from the Code itself. We note, however, that interrater reliability between student raters was only modest, indicating some subjective component in applying the CRTC Code as it stands to digital images from bars.

Third, by focussing specifically on drinking venues considered popular in four campus towns, the generalizability of the present findings is limited. Nonetheless, the fact that similar results were obtained across all four towns is indicative that bars in other university cities and towns in Canada are also likely to employ social media to encourage student drinking.

Conclusion

This study contributes to the broader consensus that there is reason for concern regarding the use of social media as a platform for marketing alcohol. An important result of this study is the insight

it provides about university students, a key audience for alcohol advertising on social media platforms. More specifically, we were able to demonstrate the scope of CRTC Code violations on social media platforms by asking students from four Canadian universities to rate alcohol portrayal and promotions posted online by popular drinking venues. We further assessed whether the extent to which drinking venues violate the CRTC Code is related to the popularity of the venues and students' own drinking behaviours.

These results serve as a reminder to territorial and provincial regulatory agencies to review their practices to ensure that alcohol advertising guidelines are applied and enforced consistently. More importantly, these results call for the adoption of federal legislation with a public health mandate, as currently exists for cannabis and unhealthy food for children, that would apply to all media, including print, television and radio, digital and social. This new legislation should include advertising restrictions such as mandatory preclearance of alcohol advertisements and effective administrative and deterrence systems, independent of the industry, for infringements on marketing restrictions.

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Conflicts of interest

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TS was a Guest Editor for this issue of the HPCDP Journal, but removed himself from the peer review process and editorial decision-making associated with this manuscript.

Authors' contributions and statement

CP conceptualized the manuscript, interpreted the data and drafted the paper. JZ built the database, planned and performed analyses and drafted the methodology section. TS helped to conceptualize the study. The authors were all involved in revising of the paper and the approval of the final manuscript for submission.

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